

## Science Reflection

It has always been the case that human society uses its environment to humanity's advantage. For the better part of our evolutionary history, that has only amounted to consuming basic resources that are present on the surface or close to the surface of the earth's crust. However, as our technology has advanced, so has our reach in terms of what resources we can access. This has led to our consumption of hydrocarbons for the production of practically all material artifacts that we today possess, which is a serious cause of concern. Any set of individuals who are so dependent upon such a solitary method of procuring energy and material possessions, must reflect upon their situation and critically analyze their relationship between both the system that they are a part of, and the rest of the world. It is important to understand the frailty of the conditions on Earth that made life possible, and in doing so, we may come to understand how we may preserve not only the Earth, but ourselves as well.

Part of this self-reflective practice that people should partake in is started and perpetuated by education. Education in human society is meant to create a collective social awareness. It is a means to an end in the way that a covalent bond holds two atoms together. It is the glue that allows us to avoid the Tragedy of the Commons; a dilemma arising from the situation in which multiple individuals, acting independently and in their own interests, will ultimately deplete a shared limited resource, even when it is clear that it is not in anyone's long-term interest for this to happen. However, after the Industrial Revolution - a period of rapid societal change due to the incorporation of machinery to improve the production methodology of material possessions - education has not been all that strong as it too was affected by the assembly-line mindset. As a whole, human society has made some very poor choices, choices that will eventually bring about

consequences we would have otherwise liked to avoid. However, the comfortable lives that people lead today are too precious for the majority of the human population to give up, lives lead with ignorance or disregard of their effects upon the Earth. This is a major fault in our society, one that has been really brought into focus by our studies of the natural world.

One particular incident we studied that portrayed the faults of our society was the BP Oil Spill. This particular incident really exemplifies the poor choices that we as human beings consciously make, yet are only too willing to blame upon each other as opposed to working to change ourselves. The maxim 'if you are not a part of the solution, then you are a part of the problem' best portrays the attitude we should have towards environmental conservation. My scientific inquiry of the BP Oil Spill has a lot of information regarding the unethical and immoral practice of using chemical dispersants on petroleum, in such a sensitive area. Basically, the authorities in charge of cleaning up BP's corporate irresponsibility knowingly introduced an agent known to be, particle for particle, 10,000 times more lethal to biotic entities, in an area of high biodiversity, close to the Thermohaline Circulation which will eventually spread this toxin all around the globe. Not only were studies on the responses to the BP Oil Spill informative, but so was the context information on modern society's dependence upon fossil fuels. It really brought into focus the precarious situation we are in when it comes to the sustainability of our society, of which there is virtually none.

My scientific inquiry of the BP Oil spill exemplifies my knowledge of the scientific aspects of that disaster very accurately. In my paper I have various examples of how the economy, society, and environment we have are affected by the spill of 5 million barrels of crude oil. I include information on the effects of the dispersant upon biotic entities, as well as explain very thoroughly what the dispersant does. Additionally, I cover the possibility that the area that

is affected by the dispersant could be increased significantly because of the Thermohaline Circulation. As the chemical-encased oil submerges from the surface oil slick it disperses along the water column, effectively creating multiple tiers that the dispersant Corexit resides within. The area affected by the Macondo well spill resides within the Gulf of Mexico, an area relatively close to a current of the Global Conveyor Belt. This proximity to the Thermohaline Circulation is a problem that could perpetuate the negative effects of the dispersant by transporting that dispersant to other areas around the world that possess high bio-diversity.

The background information in my scientific inquiry is very detailed, demonstrating my understanding of the natural world's aquatic environment as well as the effects of anthropomorphic chemicals that are introduced into the natural world. It shows my understanding of sustainability, of bio-diversity, of hydrological interactions, and of the immoral practices of modern society. It also portrays my understanding of the scientific method, in two ways. The first is obvious. I used the scientific method to create my groups experiment and to assess what form of cleaning method was best. As a group we had to come to understand what exactly it was that we were attempting to analyze through a scientific lens. In other words, we needed to know what question we were trying to answer. In order to make the question into something measurable through scientific methods, we had to create a detailed hypothesis using the 'If...then...because' format. This meant that we would then be able to design an experiment that could effectively measure the difference in the efficiency of the two cleaning methods we decided to use, dispersants and absorbents.

The second is something that is not so clear at first, but that one can come to understand as valid. In analyzing the scientific method, I came to understand that the methodology of measuring change through a scientific lens, at its basics, was only a process of observation,

interpretation, analysis, and synthesis. At first it was a challenge to understand how I would be able to connect the 'big picture' with a relatively short science experiment, yet it was in writing my thesis that I came to realize how the scientific method is only a fancy term used for such a basic intuitive human faculty. The scientific method is something that I used throughout my project, unknowingly yet willingly. This is something that I have done all throughout my four years as a science student at CAT. Although freshman years is a little sketchy to my memory, I remember learning about and working on a Rube Goldberg machine. I believe that the basic lesson we were taught there is that every action has a reaction, and that a single missed step can be responsible for the downfall of everything else. In Sophomore year, I remember studying different methods of acquiring electricity, more specifically my research of Tidal Power. This was the start of our investigation of sustainability, and the faults of our society's methods of procuring energy. I came to learn in that year of how our society is so focused upon innovation, that we no longer concern ourselves with preservation. Junior year was slightly different, in that we were studying biology. However, that taught me a valuable lesson as well. In researching any number of infectious diseases, I came to understand the persistence of life. I came to understand that every living organism is living in a very precarious environment, and that the smallest changes in the environment can have very serious consequences. This year, the BP Oil Spill lab taught me that we really need to understand what it is we do to our environment, because something that is seemingly beneficial can in actuality be very harmful. It is only in reflection that I come to realize how thinking critically plays a significant role in the interpretation of a scientific perspective. It is through reflection that I come to understand that as human beings we never cease to use the scientific method, as we constantly assess our own environment, and how it will affect us personally.

Yet, all throughout the four years I have spent as a science student at CAT, there has been a single recurring message. In its most basic form, the scientific method is observation, analysis, and synthesis, all faculties innate to human beings. This is something that has constantly been reinforced by my studies as a science student here at CAT, yet has been augmented by the instillment of moral values along with the knowledge I have gained. It is this ability to efficiently assess our natural world that the scientific method allows, an ability that is refined both in theoretical and empirical studies. In understanding the natural world, I have come to understand my own methodology of inquiry. As Albert Einstein said, “The whole of science is nothing more than a refinement of everyday thinking.”